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FOREST RESEARCH NOTES



NORTHEASTERN FOREST EXPERIMENT STATION

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Weevil - Red Rot Associations

In Eastern White Pine

The presence of red rot (*Fomes pini*) in pruned white pine stands has often been attributed to the act of pruning. This assumption may well be true for heavily stocked stands where thinning has been neglected and pruning scars are slow to heal. The question then arises: How do we account for the red rot often found in vigorous unpruned white pine stands? Evidence collected in connection with a white pine log-grade study* at the Pack Demonstration Forest at Warrensburg, N. Y., strongly suggests that the white pine weevil was responsible for much of the red rot found in the trees examined.

Such a conclusion is based mainly on these facts: (1) Red rot infections were $2\frac{1}{2}$ times more frequent in heavily weeviled trees (five or more weevil injuries per tree) than in trees having fewer injuries. (2) Out of a total of 74 red rot infections found in the 97 trees examined, 58 (80 per cent) were associated with weevil injury.**

The data (table 1) seem to indicate a clear-cut case against the weevil: weevil injuries appear to be a major factor in creating conditions that are favorable for red rot infection. However, the question arises as to whether these ratio differences are due to the possibility that heavily weeviled trees were also genetically more rot-susceptible, or whether they are due to the presence of more infection points on the heavily weeviled trees.

The latter reasoning appears more logical. Dead weeviled leaders usually remain attached to the tree for many years. Observations indicate that about 50 years elapse before the majority of them are completely overgrown. Red rot attacks and follows the pith of these dead leaders to the heartwood zone of the host. It then continues its early

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** FOR THE PURPOSES OF THIS REPORT, RED ROT WAS CONSIDERED TO BE 'ASSOCIATED WITH WEEVIL INJURY' IF IT WAS FOUND IN OR ADJACENT TO AN OLD WEEVILED LEADER WHEN THE LOGS WERE SAWED INTO LUMBER. 'WEEVIL INJURY OR ATTACK' REFERS TO ALL WEEVIL AND WEEVIL-LIKE INJURIES OBSERVED, ALTHOUGH SOME OF THESE MAY HAVE BEEN CAUSED BY BIRDS, SQUIRRELS, OR OTHER INSECTS.

Table 1.--Relationship of red rot occurrence to severity of weevil attack in 97 white pine trees on Pack Forest in 1955

Weevil injuries per tree (number)	Trees with red rot infections		Trees without red rot infections		Total
	Number	Percent	Number	Percent	Number
None	0	0	6	100	6
1-4	15	33	30	67	45
5 or more	34	74	12	26	46
Total	49	--	48	--	97

activity in the pith zone of the tree. The rapidity with which the fungus spreads in the porous pith zone suggests that an outside air supply is a vital factor in its development.

Inspection of the original data from the six unweeviled and rot-free trees does not reveal any startling information. The growth rates of these trees had been slow to moderate, which might have resulted in the development of slender leaders less susceptible to weevil damage. However, these trees, varying in age from 46 to 120 years, were growing on a mixture of sites, and all but one were growing in even-aged pure pine stands.

Only 16 red rot infections out of a total of 74 could not be definitely associated with weevil injury. Nine of these infections were in butt logs, six being in trees 100 years of age or older. The presence of small limb stubs and punk knots tend to indicate that most of these were branch infections, although in some cases advanced decay may have destroyed the possible evidence of weevil injury.

Six red rot infections were confined to large knots in the logs. It is quite possible that some of these may have resulted from weevil injuries in the limbs.

Losses due to red rot in young and middle-aged white pine stands can be blamed to a large extent on weevil injury. Until a practical means of controlling the weevil is developed, these losses can be minimized by the removal of weeviled trees in thinnings and by the early removal of weeviled leaders during pruning operations.

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